

Note on Mr. Ritchey's Photographs of the Andromeda Nebula.
By W. H. Wesley.

(Communicated by the Secretaries.)

At the meeting of the Society in 1903 March there were exhibited a series of photographs of nebulae taken by Mr. G. W. Ritchey with the 24-inch reflector of the Yerkes Observatory. The photographs were remarkable as showing in the *Andromeda* and *Orion* nebulae the detail both in the bright central portions and in the faint outlying parts, and the question was raised as to whether some selective process of development or printing had been employed.

In the *Monthly Notices* for 1903 May (vol. lxiii. p. 395) appeared a letter from Mr. Ritchey fully explaining the process he adopted in developing astronomical negatives. Mr. Ritchey further says that "in the case of such objects as the *Orion* and *Andromeda* nebulae something more is needed if the detail in the bright central parts and the faint extensions are both to be shown on the same positive. One negative is reserved precisely as developed by the above method. For transparencies and lantern-slides a second negative is exposed in the telescope, developed as above described, and the parts which are so dense that they cannot be printed are reduced locally by the use of a very weak reducing solution. Much time and care are given to this, and an attempt is made to keep the relative brightness of the various parts the same in kind, though not in degree, as in the untouched negative, which is constantly used for comparison during the process."

The two beautiful transparencies, therefore, which Mr. Ritchey presented to the Society, and which were shown at the March meeting, were taken from negatives which had been locally reduced. The advantages of showing on the same plate the detail of all parts of the nebula are sufficiently obvious. At the same time, while the utmost care was evidently taken with the reduction, it seemed very desirable to compare these photographs with entirely untouched negatives to find if any false effects or spurious detail had been introduced by the process.

A short time ago Mr. Ritchey sent, through Mr. Hinks, two untouched negatives of the *Andromeda* nebula, so that, with regard to this nebula the opportunity was afforded for such a comparison. The negative from which the enlarged transparency was made had an exposure of four and a half hours; and as one of the untouched negatives had been exposed four hours it was particularly suitable for the comparison. The detail of the nebula is so complex that I principally concentrated my attention upon the finer detail immediately surrounding the great central condensation, as this was most liable to be affected by the local reduction. I examined with special care the edges of

the dark rifts, where the bright bands are broken up into very minute flocculent patches. The result of my examination is that I find nothing on the transparency that is not on the negative. I specially looked for any *edge* of greater brightness which might mark the limit which the reducing solution reached, but can find nothing of the kind. I can therefore only conclude that the process of local reduction has been so carefully carried out that no spurious detail has been produced in the negative from which this transparency was made.

Since the prolonged examination of small details renders one extremely liable to overlook larger and more general effects, I have repeatedly broken off my examination and resumed it on other occasions ; but the other results have always been the same. Mr. Hinks and I have also together compared the photographs, but we both came to the conclusion that whatever was in the transparency could be found in the untouched negatives.

New Double Stars detected with the 17 $\frac{1}{4}$ in. Reflector during the year 1903. By T. E. Espin, M.A.

The following stars have been found to be double during the year 1903. As they are so few, and the measures are for the most part incomplete, I have not numbered them.

B.D.	R.A. 1880	Decl.	P.	D.	Mags.	
°	h	m	°	°		
53°234	1	25	+ 53 59	215°7	5°1.	8.6 11.8
63°1346	17	21.4	63 51	19°1	6.5	9.0 11.5
64°1256	18	15.6	64 1	332°7	8.6	8.2 12.0
51°2372	20.9		51 35	198°7	2°7	8.6 8.7
60°1844	42.4		60 32	103°6	4.3	9.1 11.1
61°1816	19	5.2	61 4	243°9	6.1	9.1 9.8
59°1979	12.7		59 33	116°3	7.4	9.0 11.6
59°1981	13.3		59 34	113°7	8.1	8.8 11.7
64°1346	20.2		64 18	216°3	4.4	8.8 9.9
64°1364	35.6		64 47	19°3	8.9	8.5 10.5
64°1369	37.8		64 39	313°7	2°7	8.8 9.4
64°1386	46.3		64 23	70°7	6.5	8.0 10.5
59°2160	57.3		59 25	145°0	4°1	9.0 11.5
52°2883	21	8.7	52 48	—	4 ±	9.0 12
63°1814	22	5.8	63 31	—	4 ±	9 11
